Informality, Incidence and Pass-through of GST Exemptions

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ANU-UPNG Seminar
3rd July 2026

Outline

1. Motivation
2. Background
3. Data and Methodology
4. Results
5. Discussions
6. Conclusion and Policy Implications

Motivation

- Fiscal policies reduce the welfare of poor households on net in lower-income countries, mainly due to GST (World Bank, 2022)
- To minimize this burden, all governments use GST exemptions (e.g., eliminating tax on basic food) (GTED, 2025)
- There is little to no evidence about how much GST exemptions actually benefit consumers in these settings (Benzarti, 2024)
  - Cross-country simulations from survey data suggest <u>GST exemptions are possibly regressive</u> (Bachas et al., 2024)
  - <u>Evidence from Argentina shows that stores do not fully pass through GST exemptions to consumers</u> (Benzarti et al., 2024)

Background: Setting

- We explore this question in Papua New Guinea, which shares many characteristics with other lower-income countries:
  - GNI per capita of USD 2,940 in 2024, with the highest levels of monetary and multidimensional poverty outside of Africa (World Bank, 2026)
  - Very high levels of informality, with 85% of over 10 million population primarily relying on subsistence agriculture (World Bank, 2026)
  - There is one major economic urban center, Port Moresby, where the vast majority of GST is collected (World Bank, 2026; Hoy et al, 2024)
  - Outside of Port Moresby, there are relatively few supermarkets that are part of an established supply chain

Background: Details on GST Exemption Reforms

- The PNG Government recently introduced a reform that aimed to assist poor households by removing taxes from basic items
- On 1 June 2025, GST, levied at a rate of 10%, was eliminated for a 13-month period.
- The following items became "zero-rated": Cooking oil, Rice, Tinned fish, Tea, Flour, Tinned meat, Chicken, Noodles, Biscuits, Coffee, Soap, Sanitary products, and Baby diapers
- Estimated fiscal cost: about K500 million / USD150 million in foregone revenue.
- Policy logic: **Lower Tax** $\rightarrow$ **Lower Prices** $\rightarrow$ **Benefits for the poor**.

Background: GST Zero-Rating Public Communication

Lower prices for 13 items

Govt plans relief for consumers

CONSUMERS can expect a 10 per cent decrease in the prices of 13 essential household items from June 1 this year to June 30 next year, according to the Internal Revenue Commission (IRC).

Commissioner-general Sam Koim, in a notice to businesses, said the essential items would be zero-rated for the Goods and Services Tax (GST), to provide some relief to consumers.

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No GST shall be charged on the following items

- Tinned Fish
- Rice
- Cooking Oil
- Biscuits
- Wheat Flour
- Chicken
- Instant noodles
- Coffee
- Tinned meat
- Sanitary pads and tampons
- Soap
- Tea
- Baby Diapers

PUBLIC NOTICE

GST ZERO-RATING OF ESSENTIAL GOODS

Effective 1st June 2025 – 30th June 2026

The Internal Revenue Commission (IRC) hereby informs the general public and the business community that, as part of the Government's response to ongoing cost-of-living pressures, the following essential goods will be zero-rated for Goods and Services Tax (GST) effective 1st June 2025 to 30th June 2026.

This means no GST shall be charged on the sale of the following items:

No.	Item	Description
1	Baby Diapers	All types of baby diapers
2	Tinned Fish	Includes mackerel, tuna, sardines, salmon, anchovies, etc.
3	Cooking Oil	All edible vegetable oils (soya bean, canola, olive, coconut, mustard oil, etc.)
4	Biscuits	All varieties including cream and salted biscuits
5	Wheat Flour	Plain, self-raising, and wholemeal (wheat-based only)
6	Chicken	Fresh, sliced, frozen, processed, and packed
7	Instant Noodles	All types packaged with seasoning (excluding pasta)
8	Coffee	Ground, powdered, or beans (excluding iced/hot coffee drinks)
9	Tinned Meat	All varieties including beef (Ox & Palm), chicken, pork (Tulip), etc.
10	Rice	Common rice types (including basmati, jasmine, long grain, brown rice, etc.)
11	Sanitary Pads & Tampons	All types
12	Soap	All solid bar soaps (excluding liquid hand wash and dishwashing liquids)
13	Tea	All types and packaging (excluding iced/hot tea drinks)

NOTICE TO BUSINESSES, RETAILERS AND SUPPLIERS:

The Government's intention is to provide direct relief to consumers. All registered suppliers, retailers, and traders are legally required to adjust their pricing to reflect the zero-rating of GST on the listed goods.

You must not charge GST on these items during the zero-rating period.

Any failure to pass on the tax relief to consumers—whether by continuing to apply GST or by retaining prices at pre-zero-rating levels—will be treated as non-compliance with tax laws. Offenders will be subject to penalties under the Goods and Services Tax Act 2003 and other relevant laws.

Data and Methodology: Data Sources used in Study

Table 1: Data sources used in the study

Data source	Coverage	Store type	Main limitation
Supermarket census	Port Moresby	Formal	Limited pre-trends
Administrative data	Port Moresby	Formal	Subset of locations
Website scraping	Port Moresby	Formal chains	Largest chains only
Phone survey panel	Nationwide	Formal and informal	Self-reported

Data and Methodology: Treatment and Control Items

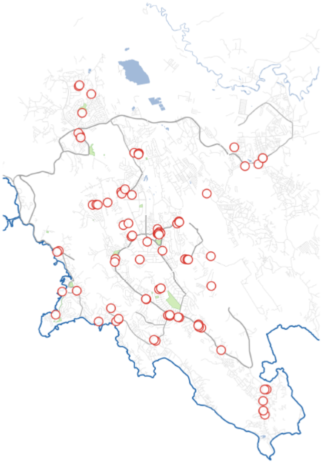
Table 2: Treatment and control items used in the empirical analysis

Treatment items	Control items
Cooking oil	Butter
Rice	Kaukau (sweet potato)
Tinned fish	Tinned baked beans
Tea	Broccoli
Flour	Sugar
Tinned beef	Sausages
Chicken	Powdered milk
Noodles	Breakfast cereal
Biscuits	Bananas
Coffee	Milo

- Treatment items are GST-exempt products after the reform.
- Control items are comparable non-exempt products used to construct the counterfactual price trend.

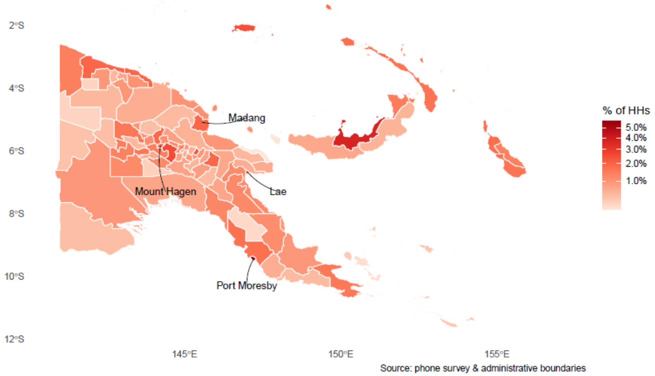
Data and Methodology: Maps

Figure 1: Map of Supermarkets in Port Moresby



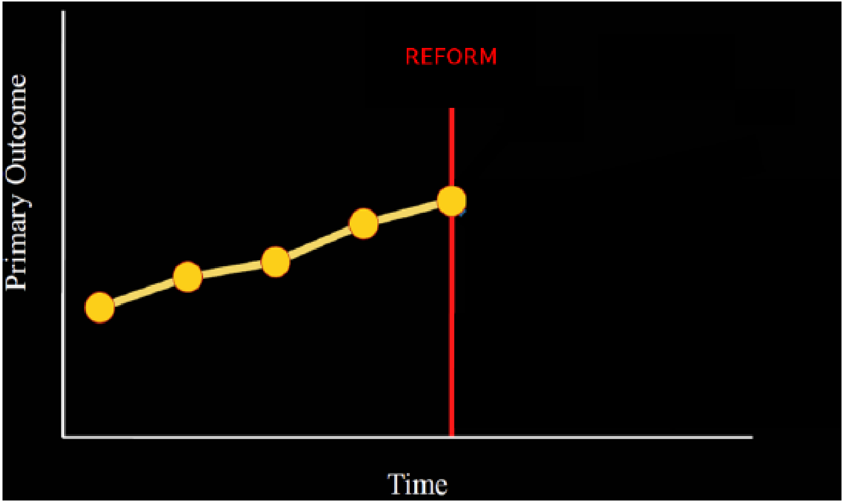
Data and Methodology: Maps

Figure 2: Map of Phone Survey Respondents by locations



Data and Methodology: DID Illustration

We used Difference in Difference (DID) Approach to estimate the impact of the Reform.



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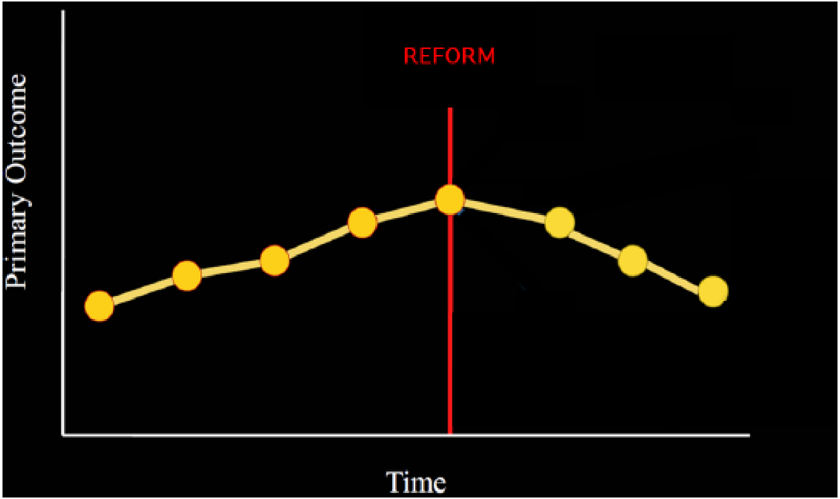

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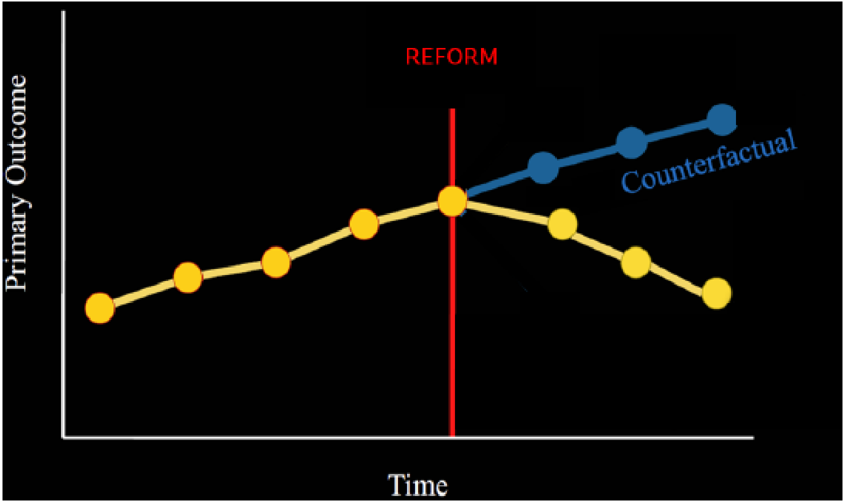

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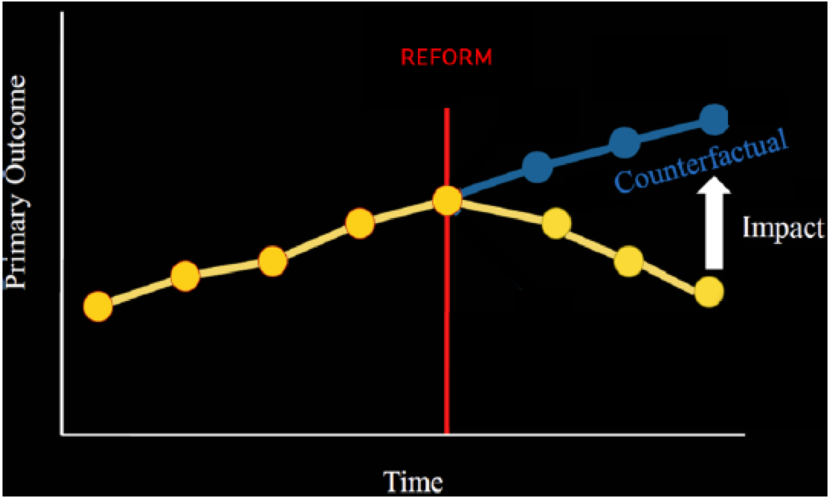

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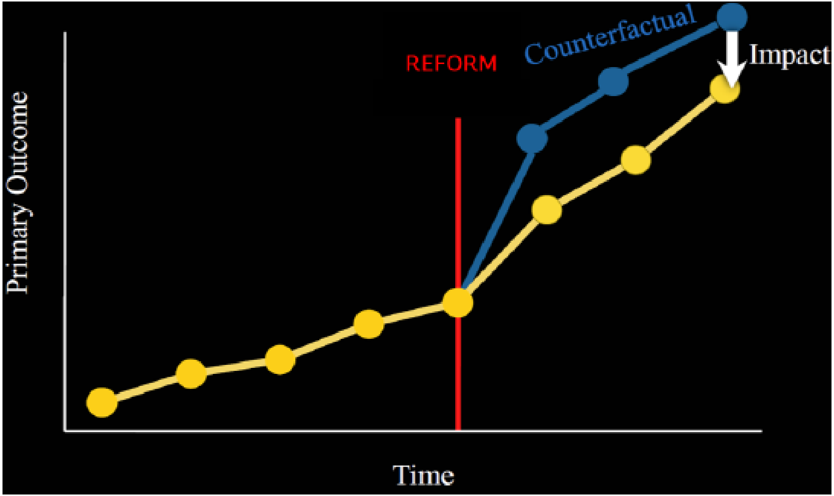


Data and Methodology: DID Empirical Specification

We use a difference-in-differences event-study design to estimate the impact of the GST exemption reform. The approach compares price changes in GST-exempt items with similar non-exempt food items before and after the reform.

$$Y_{ist} = \mu + \alpha_i + \lambda_s + \gamma_t + \sum_{\tau \neq \text{May 2025}} \beta_\tau \left(T_i \times \mathbf{1}\{t = \tau\} \right) + \varepsilon_{ist} \qquad (1)$$

- Y_{ist}: tax-inclusive price of item i in store/outlet s and month t, indexed to May 2025.
- μ: constant term.
- α_i: item fixed effects.
- λ_s: store or outlet fixed effects, where available.
- γ_t: month fixed effects.
- T_i: indicator equal to one if item i is GST-exempt after the reform.
- $\mathbf{1}\{t = \tau\}$: month indicator, with May 2025 omitted as the baseline month.
- β_τ: dynamic treatment effect in month τ, relative to May 2025.
- ε_{ist}: error term, with standard errors clustered at the item level.

Data and Methodology: Fixed Effects by Dataset

The fixed-effects structure varies slightly across the four datasets, depending on the level at which prices are observed.

Dataset	**Fixed effects included**
Supermarket census data	Store fixed effects (λ_s) and month fixed effects (γ_t)
Website scraping data	Store fixed effects (λ_s), item fixed effects (α_i), and month fixed effects (γ_t)
Administrative data	Item fixed effects (α_i) and month fixed effects (γ_t)
Phone survey data	Item fixed effects (α_i) and month fixed effects (γ_t)

- Store fixed effects absorb time-invariant differences across supermarkets or outlets.
- Item fixed effects absorb permanent price differences across products.
- Month fixed effects absorb common inflationary or seasonal shocks affecting all items.

Data and Methodology: Identifying Assumptions

Our difference-in-differences design relies on three main identifying assumptions.

1. **No anticipation**

   Firms and consumers did not adjust prices or purchasing behaviour before the GST exemptions were introduced. This is plausible because the policy was announced with limited notice, leaving little scope for pre-emptive price adjustment or inventory management.

2. **Valid counterfactual**

   Non-exempt food items provide a credible comparison group for exempt items in the absence of the policy change. This requires that the reform did not independently induce large differential demand shifts or substitution across exempt and non-exempt goods.

3. **Tax incidence, not enforcement changes**

   The estimates capture changes in statutory tax incidence rather than changes in tax enforcement. The exemptions applied uniformly at the product level and did not directly alter enforcement intensity for remaining taxable items.

Together, these assumptions allow β_τ to be interpreted as the dynamic pass-through effect of the GST exemption reform on exempt-item prices.

Data and Methodology: Expert Prediction Survey

To complement the main empirical analysis, we conducted an expert prediction survey to benchmark our findings against prior expectations in the field.

- The survey was hosted on the Social Science Prediction Platform (SSPP).
- It was open for a 12-week period, from July to September 2025.
- Experts were invited from the existing SSPP researcher pool and through the authors' social media networks.
- A total of 237 experts accepted the invitation and participated in the survey.

Expert characteristic	**Share of participants**
Economics as main field	92%
Worked in academia	62%
Detailed subject-matter knowledge	59%
Very relevant country experience	62%

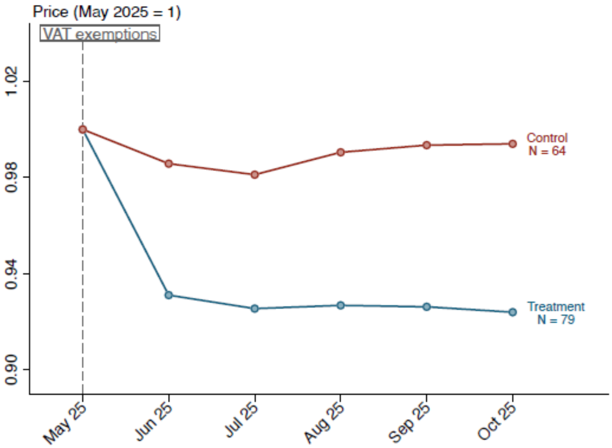
- The survey provides a quantitative illustration of how the study's results contribute to the existing knowledge base.

Results: Roadmap

1. **Port Moresby raw trends:** Did prices move after the GST exemption?
2. **Port Moresby DID estimates:** Did exempt items fall relative to non-exempt control items?
3. **Competition mechanism:** Was pass-through stronger in more competitive stores?
4. **Nationwide evidence:** Did the same pass-through occur outside Port Moresby?
5. **Incidence:** Who ultimately captured the foregone GST revenue?

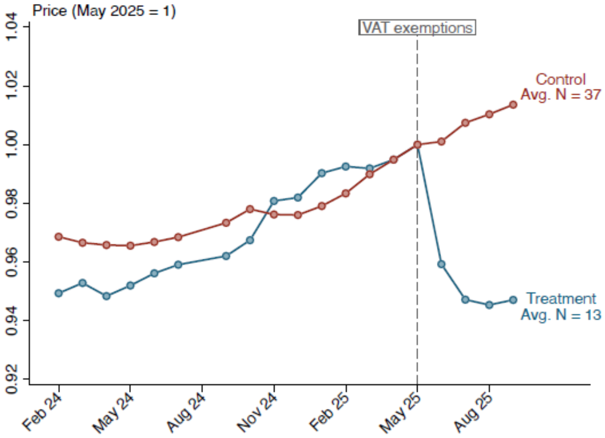
Result 1: Raw Price Trends in Port Moresby

Figure 3: Raw price trends for exempt and non-exempt items: supermarket census data



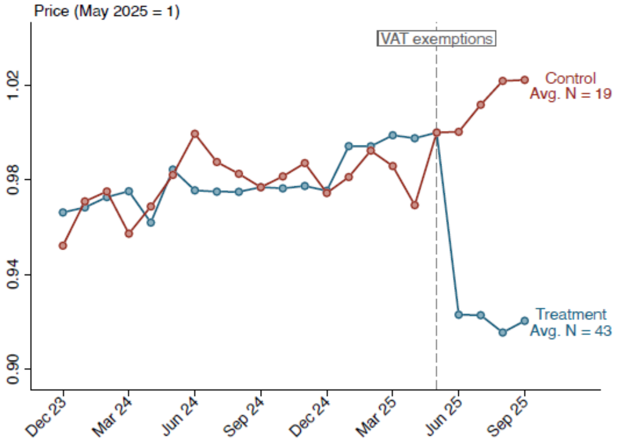
Result 1: Raw Price Trends in Port Moresby

Figure 4: Raw price trends for exempt and non-exempt items: Central Bank administrative data



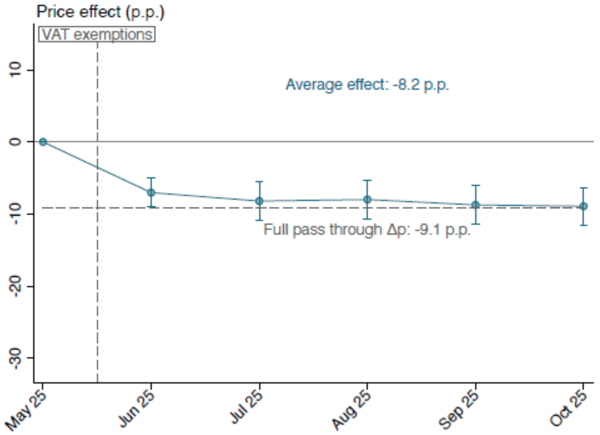
Result 1: Raw Price Trends in Port Moresby

Figure 5: Raw price trends for exempt and non-exempt items: NSO administrative data



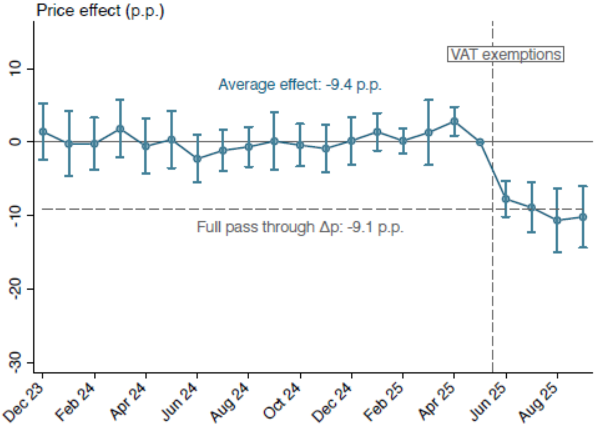
Result 2: DID Estimates for Port Moresby

Figure 6: DID estimate of pass-through to prices: supermarket census data



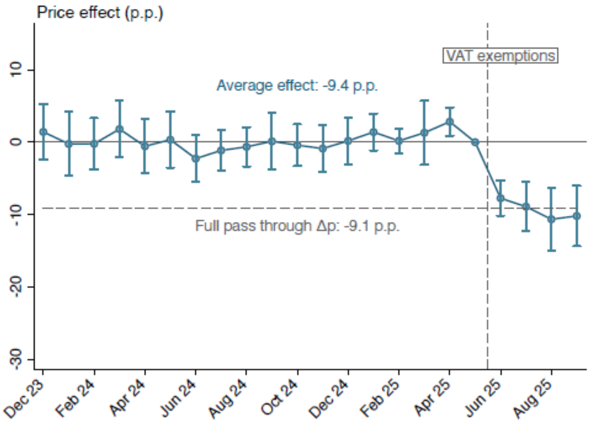
Result 2: DID Estimates for Port Moresby

Figure 7: DID estimate of pass-through to prices: Central Bank administrative data



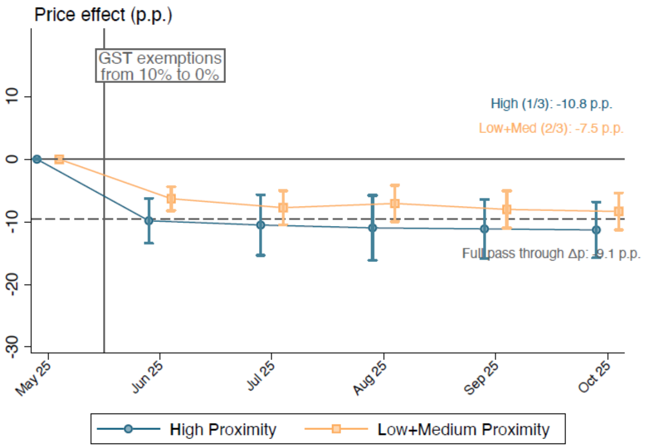
Result 2: DID Estimates for Port Moresby

Figure 8: DID estimate of pass-through to prices: NSO administrative data



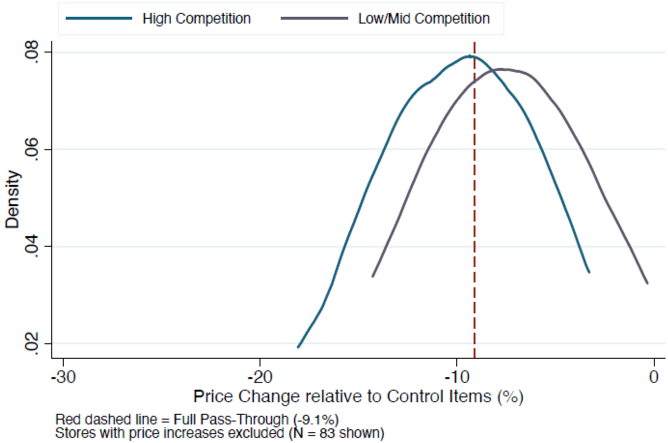
Result 3: Competition and Pass-through

Figure 9: Pass-through by competitive pressure among Port Moresby stores



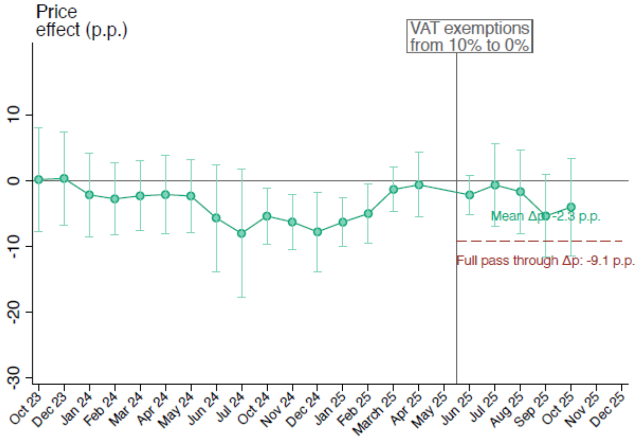
Result 3: Competition and Pass-through

Figure 10: Heterogeneity in pass-through by level of store competition



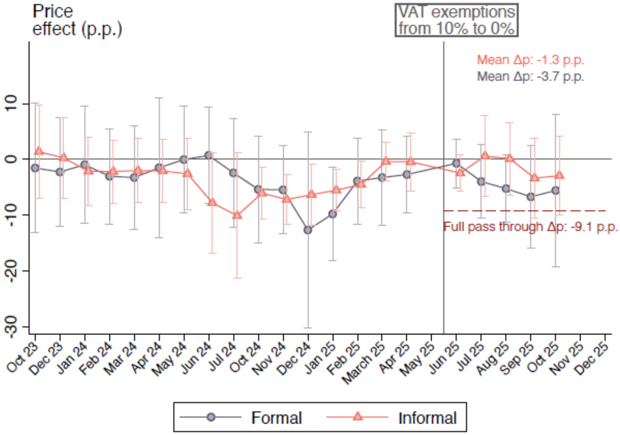
Result 4: Nationwide Pass-through

Figure 11: DID estimate of pass-through to prices: nationwide phone survey evidence



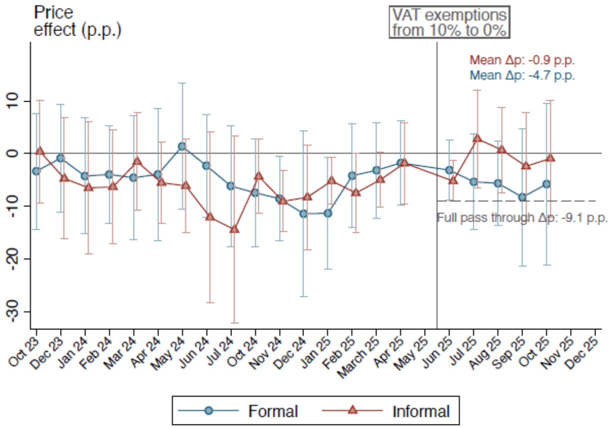
Result 4: Nationwide Pass-through by Store Formality

Figure 12: DID estimate of nationwide pass-through by store formality



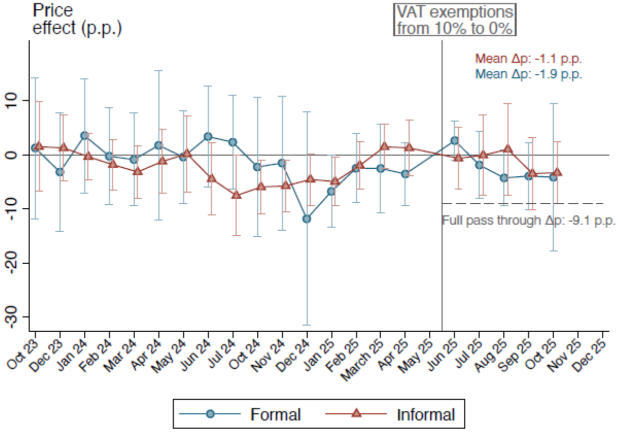
Result 4: Urban Pass-through by Store Formality

Figure 13: DID estimate of pass-through in urban areas by store formality



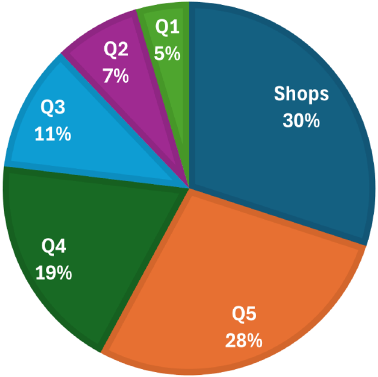
Result 4: Rural Pass-through by Store Formality

Figure 14: DID estimate of pass-through in rural areas by store formality



Results 5: Actual Incidence and Expert Predictions

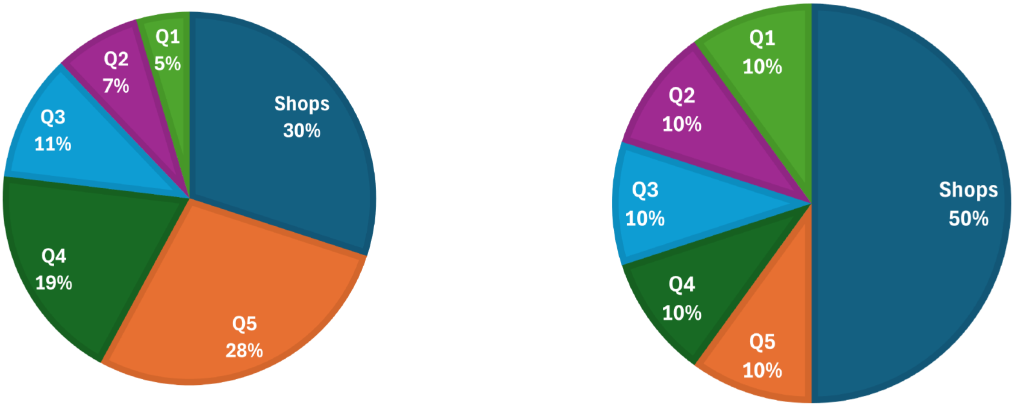
Figure 15: Actual incidence and expert predictions of revenue lost across quintiles and stores



Actual Incidence

Results 5: Actual Incidence and Expert Predictions

Figure 15: Actual incidence and expert predictions of revenue lost across quintiles and stores



Actual Incidence

Expert Predictions

Discussion: What the Evidence Shows

Main finding

The GST exemptions did not significantly benefit poorer households. Instead, richer households and store owners captured most of the benefits.

- Formal supermarkets in central Port Moresby showed very high pass-through.
- Outside these competitive formal markets, pass-through was much weaker.
- Store owners were able to retain part of the tax benefit where competition was limited.
- On average, around **30 percent** of foregone revenue went to formal store owners.

The policy reduced prices where markets were formal and competitive, but poorer households were less connected to those markets.

Our findings on the regressive nature of GST exemptions are consistent with previous studies such as Warwick et al. (2022) and Inchauste et al.(2024). They argues that alternative fiscal policies can be more effective in supporting poor households.

Discussion: Why the Reform Was Regressive

Poorer households

- Buy less from formal stores.
- Rely more on informal markets and own production.
- Face weaker pass-through in rural and less competitive locations.
- Received only about **5 percent** of the foregone revenue.

Richer households

- Purchase more exempt goods.
- Shop more often in formal stores.
- Benefit more when prices fall in supermarkets.
- Received around **one-third** of the foregone revenue.

Incidence depends not only on what goods are exempted, but also on where households shop and whether stores pass the tax cut into prices.

Policy Implications

- **Broad GST exemptions are costly:** They reduce government revenue without strongly targeting poor households.
- **Pass-through is uneven:** Tax cuts work better in competitive formal markets than in informal or spatially protected markets.
- **The policy is weakly targeted:** Benefits are captured by richer households and store owners.
- **Better alternatives exist:** Even imperfect social protection or targeted cash transfers are likely to be more progressive than broad GST exemptions.

Future Research

1. Link price data with household purchases to better measure pass-through and incidence.
2. Study competition more directly to understand when firms pass tax reductions to consumers.
3. Examine inferior versus normal goods to test whether VAT/GST exemptions become less regressive in different income settings.
4. Use novel price data to study public finance and market power in low-income and high-informality economies.

Thank You

Thank you

Questions, comments, and suggestions are welcome.

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